UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/667,534	09/22/2003	Adan Rios	RIOS:004USC2/10311652	9949

32425 7590 03/31/2009

FULBRIGHT & JAWORSKI L.L.P.
600 CONGRESS AVE.
SUITE 2400
AUSTIN, TX 78701

EXAMINER	
PARKIN, JEFFREY S	

ART UNIT	PAPER NUMBER
1648	

MAIL DATE	DELIVERY MODE
03/31/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ADAN RIOS

Appeal 2009-1967
Application 10/667,534
Technology Center 1600

Decided:[1] March 31, 2009

Before DEMETRA J. MILLS, ERIC GRIMES, and JEFFREY N. FREDMAN, *Administrative Patent Judges*.

MILLS, *Administrative Patent Judge*.

DECISION ON APPEAL

---

[1] The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, begins to run from the decided date shown on this page of the decision. The time period does not run from the Mail Date (paper delivery) or Notification Date (electronic delivery).

STATEMENT OF CASE

This is an appeal under 35 U.S.C. § 134. The Examiner has rejected the claims for lack of written description. We have jurisdiction under 35 U.S.C. § 6(b). The following claim is representative.

48. A method of eliciting an immune response comprising:
obtaining a viral particle comprising a reverse transcriptase that has been inactivated by binding said reverse transcriptase with one or more azido-lableled compounds and then irradiating said reverse transcriptase; and
administering the viral particle to a subject, wherein an immune response is elicited in the subject.

Ground of Rejection

Claims 40-50 are rejected under 35 U.S.C. §112, first paragraph for lack of written description.

References Relied on by Appellant

Flavell, "Retroelements, reverse transcriptase and evolution," *Comp. Biochem. Physiol.,* Vol. 110B, No. 1, pp. 3-15 (1995).

Boeke, "The unusual phylogenetic distribution of retrotransposons: A hypothesis," *Genome Res.,* Vol. 13, pp. 1975-1983 (2003).

Nakamura et al., "Telomerase catalytic subunit homologs from fission yeast and human," *Science,* Vol. 277 (August 15, 1997).

Springer et al., "Phylogenetic relationships of reverse transcriptase and Rnase H sequences and aspects of genome structure in the gypsy group of retrotransposons," *Mol. Biol. Evol.,* 10 (6), pp. 1370-1379 (1993).

Lingner et al., "Reverse transcriptase motifs in the catalytic subunit of telomerase," *Science*, Vol. 276, p. 561 (1997).

Valverde-Garduno et al., "Functional analysis of HIV-1 reverse transcriptase motif C: site-directed mutagenesis and metal cation interaction," *J. Mol. Evol.*, 47(1), pp. 73-80 (1988).

Seifarth et al., "Rapid identification of all known retroviral reverse transcriptase sequences with a novel versatile detection assay, AIDS Research and Human Retroviruses," *Aids Research and Human Retroviruses,* Vol. 16, No. 8, pp. 721-729 (2000).

ISSUE

The Examiner argues that the claims are broad and the disclosure fails to teach the inactivation of any other retroviral or retrotransposon reverse transcriptases (RTs) other than HIV-1.

The Applicant argues that

> HIV is a retrovirus and a unique aspect of retrovirus replication is the conversion of a single-stranded RNA from the virus genome into a doublestranded DNA molecule that must integrate into the genome of the host cell prior to the synthesis of viral proteins and nucleic acids (Specification, p. 3, ln. 4-12). Accordingly, all retroviruses possess a reverse transcriptase enzyme, which converts the RNA of their genetic material into DNA (Specification, p. 3, ln. 14-16). Furthermore, since all reverse transcriptases prime the synthesis of new DNA from tRNA, which is a molecule with abundant secondary structure strongly associated with the enzyme, it is generally accepted that the catalytic unit among reverse transcriptases is phylogenetically conserved.

(App. Br. 3.)

The issue is: Has the Examiner shown that the disclosure does not convey with reasonable clarity to those skilled in the art, that the inventor was in possession of the invention, and is there written descriptive support in

the Specification for inactivation of reverse transcriptases generally and for the method of illiciting an immune response, as claimed?

FINDINGS OF FACT

The Examiner finds that:

1. "The claims of the instant application are directed toward a method of eliciting an immune response by obtaining a viral particle comprising a reverse transcriptase (RT) that has been inactivated with one or more azido-labeled compounds followed by irradiation." (Ans. 6.)

2. "The broadest claims are not directed toward any particular source of the RT enzyme. Perusal of the disclosure demonstrates that applicants were clearly focused on HIV-1, in particular for the development of an efficacious vaccine." (Ans. 6.)

3. In summarizing his invention (Spec. p. 2, lines 11-19) [A]pplicants stated the following:

> The present invention relates generally to the fields of virology, immunology, disease treatment, and prevention. More particularly, it concerns HIV particles with inactivated reverse transcriptase, methods of inactivation, and the use of such particles to prepare components of HIV and to elicit effective immunological responses to HIV. These immune responses are useful in producing diagnostic reagents, assays, and kits for the diagnosis of HIV and related retroviral disease, providing protection from an HIV challenge, and assisting an HIV-infected individual in controlling the replication of the virus. Methods of inactivation are useful for preventing disease through decreasing the risk of infection associated with exposure to HIV infected tissues and materials. [p. 2, 1. 11-19]

(Ans. 6-7.)

4. "The [S]pecification in describing the related art discusses only HIV." (Ans. 7.)

7. No other retroviruses are described to any extent in the Specification. 5Ans. 7.)

6. "The [S]pecification discusses HIV biology and the worldwide geographic distribution of the virus (pp. 16-18). All of the examples provided in the [S]pecification involve HIV-1 RT (e.g., see Example 1: photoinactivation of HIV-1 RT [p. 30-31; Example 2: inactivation of HIV particles and infected cells [p. 31])." (Ans. 7-8.)

7. There is no mention of any other retroviral or retrotransposon RTs in the Specification. (Ans. 8.)

8. The *Retroviridae* encompass several genera including the avian-leukosis-sarcoma viruses (e.g., Rous sarcoma virus (RSV), avian myeloblastosis virus (AMV), avian erythroblastosis virus (AEV), avian myelocytomatosis virus (MC)), mammalian C-type retroviruses (e.g., Moloney murine leukemia virus (Mo-MLV), Harvey murine sarcoma virus (Ha-MSV), Abelson murine leukemia virus (A-MuLV) , feline leukemia virus (FeLV), reticuloendotheliosis virus (REV), spleen necrosis virus (SNV)), B-type viruses (e. g., Mouse mammary tumor virus (MMTV)) , D-type viruses (e. g., Mason-Pfizer monkey virus (MPMV) , "SAIDS" viruses), HTLV-BLV viruses (e. g., Human T-cell leukemia virus (HTLV-I and -II), Bovine leukemia virus (BLV)), lentiviruses (e.g., human immunodeficiency virus (HIV-1 and -2 simian immunodeficiency virus (SIV), feline immunodeficiency virus (FIV), bovine immunodeficiency virus (BIV), Visna/maedi virus, caprine arthritis-encephalitis virus (CAEV), equine infectious anemia virus (EIAV)), and spumaviruses (e. g., simian foamy virus (SFV), human foamy virus (HFV), human spumaretrovirus (HSRV)). The [S]pecification fails to discuss any other virus other than HIV. Once again, there is no indication that [A]pplicants contemplated inactivating RT from any of the aforementioned viruses except HIV-1.

(Ans. 8.)

9. "The disclosure fails to teach the inactivation of any other retroviral or retrotransposon RTs other than HIV-1." (Ans. 8.)

10. The Examiner concludes that "the skilled artisan would conclude that applicants were not in possession of the full genus claimed." (Ans. 8.)

11. According to the Specification, page 13, the immune response may be a humoral response, a cellular response or both a humoral and cellular response. "The cellular response may be a CD8+ T cell response, a CD4+ T cell, or both a CD8+ T cell and a CD4+ cell response," however, throughout the [S]pecification, the disclosure particularly is directed to a protective immune response to HIV. (Spec. 13.)

12. The Specification, page 16, ll. 20-25 provides that, it is "of importance to note that the methodology of the present invention is applicable to any retrovirus which may be associated with any animal or human disease as a method for development of effective immunogens and preventive vaccines."

13. "In one embodiment the RT is inactivated by one or more compounds that binds the RT and then irradiating bound RT with UV light. . . . . In one embodiment of the compound that binds to RT is an azido labeled compound." (Spec. 12: 8-18.)

14. Lingner, Figs. 2 and 3 evidence that reverse transcriptase domains are shared by multiple reverse transcriptases, with several highly conserved regions. (Lingner, 562.)

PRINCIPLES OF LAW

"[The written description] inquiry is a factual one and must be assessed on a case-by-case basis." *Purdue Pharma L.P. v. Faulding, Inc.*, 230 F.3d 1320, 1323 (Fed. Cir. 2000). The Specification need not describe the invention in the same terms used in the claims, but the disclosure must

convey with reasonable clarity to those skilled in the art that the inventor was in possession of the invention. See *id.*

The degree of specificity required to adequately describe an invention "varies with the nature and scope of the invention at issue, and with the scientific and technologic knowledge already in existence." *Capon v. Eshhar*, 418 F.3d 1349, 1357 (Fed. Cir. 2005). *See also id.* at 1359 ("[W]hat is needed to support generic claims to biological subject matter depends on a variety of factors, such as the existing knowledge in the particular field, the extent and content of the prior art, the maturity of the science or technology, the predictability of the aspect at issue, and other considerations appropriate to the subject matter.") *See, e.g., In re Wallach*, 378 F.3d 1330, 1333-34 (Fed. Cir. 2004) (an amino acid sequence supports "the entire genus of DNA sequences" that can encode the amino acid sequence because "the state of the art has developed" such that it is a routine matter to convert one to the other); *Univ. of Rochester v. G.D. Searle & Co.*, 358 F. 3d 916, 925 Cir. 2004). (considering whether the patent disclosed the compounds necessary to practice the claimed method, given the state of technology); *Singh v. Brake*, 317 F.3d 1334, 1343 (Fed. Cir. 2002) (affirming adequacy of disclosure by distinguishing precedent in which the selection of a particular species within the claimed genus had involved "highly unpredictable results"). Furthermore, an actual reduction to practice is not required for written description. *See Univ. of Rochester v. G.D. Searle & Co.*, 358 F. 3d at 926. This written description requirement applies not only to compositions of matter, but to methods as well. *University of Rochester v. G.D. Searle & Co.*, 358 F.3d at 926.

Claim Interpretation and Claim Scope

Claim 48 is directed to a method of eliciting an immune response comprising: obtaining a viral particle comprising a reverse transcriptase that has been inactivated by binding said reverse transcriptase with one or more azido-labeled compounds and then irradiating said reverse transcriptase; and administering the viral particle to a subject, wherein an immune response is elicited in the subject.

Any immune response is encompassed by the claimed method, which is not limited to protective immune responses. (FF 13.) The claims encompass the use of any viral particle including a reverse transcriptase that has been inactivated by binding the reverse transcriptase with one or more azido-labeled compounds and then irradiated.

ANALYSIS

The Appellant argues that:

> HIV is a retrovirus and a unique aspect of retrovirus replication is the conversion of a single-stranded RNA from the virus genome into a doublestranded DNA molecule that must integrate into the genome of the host cell prior to the synthesis of viral proteins and nucleic acids (Specification, p. 3, ln. 4-12). Accordingly, all retroviruses possess a reverse transcriptase enzyme, which converts the RNA of their genetic material into DNA (Specification, p. 3, ln. 14-16). Furthermore, since all reverse transcriptases prime the synthesis of new DNA from tRNA, which is a molecule with abundant secondary structure strongly associated with the enzyme, it is generally accepted that the catalytic unit among reverse transcriptases is phylogenetically conserved.

(App. Br. 3.)

We conclude that the Examiner has not provided sufficient evidence to show that, in view of the Specification, the skilled artisan would not have

been placed in possession of the method of the claims. In particular, the skilled artisan would have been in possession of the general technique disclosed in the Specification of inactivating HIV reverse transcriptase as applicable to reverse transcriptases generally (*see* FF 11), which share similar conserved structure and catalytic units. Therefore that the Examiner has not shown that the Specification fails to adequately describe the invention of the claims on appeal.

"The 'written description' requirement serves a teaching function, . . . in which the public is given 'meaningful disclosure in exchange for being excluded from practicing the invention for a limited period of time.'" *University of Rochester v. G.D. Searle & Co., Inc.* , 358 F.3d 916, 922 (Fed. Cir. 2004) (citation omitted). Another "purpose of the 'written description' requirement is . . . [to] convey with reasonable clarity to those skilled in the art that, as of the filing date [ ], [the applicant] was in possession *of the invention*." *Vas-Cath Inc. v. Mahurkar* , 935 F.2d 1555, 1563-64 (Fed. Cir. 1991). *See also Enzo Biochem Inc. v. Gen-Probe Inc.*, 296 F.3d 1316, 1329 (Fed. Cir. 2002). The requirement is satisfied when the Specification "set[s] forth enough detail to allow a person of ordinary skill in the art to understand what is claimed and to recognize that the inventor invented what is claimed." *University of Rochester*, 358 F.3d at 928. It is the Examiner's "initial burden [to] present[ ] evidence or reasons why persons skilled in the art would not recognize in the disclosure a description of the invention defined by the claims" (*In re Wertheim*, 541 F.2d 257, 263 (CCPA 1976)). "[A]pplicants have some flexibility in the 'mode selected for compliance' with the written description requirement" (*University of Rochester*, 358 F.3d at 928); it is well settled that actual reduction to practice is not necessary to satisfy the requirement (*id.*, at 926).

Appellant argues that:

> Since retroviruses cannot integrate into the genetic machinery of the host cell without reverse transcription, the inhibition of reverse transcriptase has as a universal consequence on the inability of any retrovirus to integrate within the genetic machinery of a suitable host cell. Thus, regardless of the type of retrovirus, the inactivation of reverse transcriptase as described in the present specification would be understood by a person of ordinary skill in the art to be applicable to any retrovirus. The importance of RT to retroviruses in general, is further evidenced by the number of known anti-retroviral compounds that interfere with RT activity (e.g., AZT [azidothymidine], nevirapine, pyridinones, carboxanilides) (Specification, p. 3, ln. 23 to p. 4, ln. 8).
>
> As described in the present specification, a reverse transcriptase may be inactivated by binding the reverse transcriptase with one or more azido-labeled compounds and then irradiating it (see e.g., p. 12, ln. 8-9). Numerous compounds that bind to reverse transcriptases were known in the art (see e.g., Specification, p. 3, ln. 23, to p. 4, ln. 11).

(App. Br. 4.)

The Examiner finds that "the various exhibits relied upon [by Appellants]… fail to support applicants' arguments," and that nothing in the Specification leads the skilled artisan to a particular retrovirus. (Ans. 9.) We find that Appellant has the better argument.

In our view, the Examiner's own rejection evidences that the skilled artisan would have been in possession of knowledge that the scope of *Retroviridae* encompasses a number of different genera (see Ans. 8). Further, the skilled artisan would have known that all of these well known retrovirus species require active reverse transcriptase activity. The Examiner's statement that "there is no indication that applicants

contemplated inactivating RT from any of the aforementioned viruses except HIV-1" is not correct. Appellants's Specification specifically states that "the methodology of the present invention is applicable to any retrovirus which may be associated with any animal or human disease as a method for development of effective immunogens and preventive vaccines" (Spec. 16, ll. 20-25; FF 12). This quotation from the Specification cannot be read as anything other than a direct teaching to apply the claimed inactivation method to known retrovriuses that are assocaited with human or animal disease. At the very least, this teaching places the skilled artisan in possession of the claimed method with known pathogenic or zoonotic retroviruses.

The Examiner has not provided adequate evidence that the skilled artisan would not have been in possession of known retroviruses. The Examiner has also not adequately addressed Appellant's argument that one of ordinary skill in the art would have understood from the conserved regions and similarity of function of reverse transcriptases generally, that they could be predictably inactivated using azido-labeled compounds and irradiation and used in the claimed method.

The evidence of record supports the Specification's description of the disclosed method as applicable to retroviruses generally, rather than applicable only to HIV. In other words, the Examiner has not provided evidence that one of ordinary skill in the art would not have understood that azido compounds bind to reverse transcriptases generally, and that one of ordinary skill in the art would not have expected that irradiated azido-labeled compounds inactivate reverse transcriptases generally.

In view of the above, we find that the Examiner has not shown that the disclosure does not convey with reasonable clarity to those skilled in the

art, that the inventor was in possession of the invention. The written description rejection is reversed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

REVERSED

Ssc:

FULBRIGHT & JAWORSKI L.L.P.
600 CONGRESS AVENUE
SUITE 2400
AUSTIN, TX 78701